The electrode port 137 is lowered to permit the electrodes 141 to come in contact with the buffer liquid contained in the reservoirs 15a, 15c, 15s, and 15w. A predetermined voltage is applied through the electrodes 141 on the reservoirs 15a, 15c, 15s, and 15w to electrophoretically separate the specimen injected in the separation passage, thus detecting the separated specimen using the detecting optical system 145 (step S14).

Thus, in the embodiment of FIG. 11, it is possible to automatically perform all of the polymer injection into the electrophoretic chip, the removal of the polymer from the reservoirs, the injection of the specimen and buffer liquid into the reservoirs, the removal of the specimen from the reservoirs after it is injected into the separation passage, the injection of the buffer liquid into the reservoirs after the removal of the specimen, and the separation and detection of the specimen.

FIG. 13 is a flowchart for showing another example of the operations of this embodiment. The operation of this embodiment shall be described below with reference to FIGS. 11 and 13. Here, as the electrophoretic medium was used an inorganic ionic buffer (hereinafter called electrophoretic buffer).

The chip 1 is positioned at the position B (step S21).

The electrophoretic-medium loading port 125 is lowered to permit the tip of the nozzle 131 to come in contact with the anode reservoir 15a of the chip 1 through the seal member 133. The channels and the reservoirs 15c, 15s, and 15w of the chip 1 are filled with an electrophoretic buffer through the nozzle 131 and the anode reservoir 15a from the syringe containing the electrophoretic buffer. When the electrophoretic buffer comes out from all of the reservoirs 15c, 15s, and 15w, the filling is ended (step S22). Although in this case the electrophoretic buffer is injected from the electrophoretic-medium loading port 125, the chip 1 may be moved to the position A to use the electrophoretic-medium suction and buffer liquid injection port 113, the discharge nozzle 119 and the discharge mechanism linked to the discharge nozzle 119, thus filling the electrophoretic buffer.

After the electrophoretic-medium loading port 125 is lifted back, the syringe 123 moves to permit the suction/discharge opening of the syringe 123 to advance to the vicinity of the inlet of the specimen-introduction passage in the

specimen reservoir 15s. The syringe 123 starts suction to thereby inject into the specimen reservoir 15s the specimen sucked beforehand in the syringe 123 from a specimen port (not shown) (step S23).

The syringe 123 is lifted back to move the chip 1 to the position C (step s24).

The electrode port 137 is lowered to permit the electrodes 141 to come in contact with the electrophoretic buffer or specimen contained in the reservoirs 15a, 15c, 15s, and 15w. A predetermined voltage is applied through the electrodes 141 on the electrophoretic buffer or specimen contained in the reservoirs 15a, 15c, 15s, and 15w to guide the specimen to the intersection between the specimen-introduction passage and the separation passage and then switch the voltage in order to inject the specimen into the separation passage (step S25) and, subsequently, electrophoretically separate the specimen so that the separated specimen can be detected by the detecting optical system 145 (step S26).

Thus, it is possible in this embodiment to perform all the injection of the electrophoretic buffer into the electrophoretic chip, the injection of the specimen into the reservoirs, and the separation and detection of the specimen.

In this case, the channels of the chip 1 can be designed arbitrarily.

The electrophoretic medium employed here is not particularly restrictive, and it may be any electrophoretic medium such as an electrophoretic buffer of an inorganic ionic buffer such as tris-boric acid, or one contains an organic polymer such as hydroxy-methyl cellulose, hydroxy-ethyl cellulose or poly acryl-amide.

Furthermore, the electrophoretic buffer and the buffer liquid are not particularly restrictive, tris-boric acid-EDTA (ethylene diamine tetra-acetic acid) (TBE)-based or tris-TAPS (tetrapentylammonium 3-{tris(hydroxymethyl)methylamino}-1-propanesulfate)-EDTA (TTE)-based ones may be used according to the electrophoretic medium or the measurement conditions employed.

Although in the embodiment shown in FIG. 11 a syringe is used as the sucking mechanism connected to the suction nozzle 117, the invention is not limited to it: for example, any other sucking mechanism such as a vacuum pump, an aspirator or the like may be used instead.

Also, although the suction nozzles 117 are connected to the respective independent syringes, the invention is not limited to it, as far as at least the suction nozzle 117 for the specimen reservoir 15s is connected to the independent syringe, the suction nozzles 117 for the other reservoirs 15a, 15b, and 15w may be connected to the common syringe. This holds true also in a case where any other sucking mechanism is used in place of the syringe.

Although a syringe is used as the discharge mechanism connected to the discharge nozzle 119, the invention is not limited to it; for example, any other discharge mechanism such as a perister pump or a pressure-application mechanism by use of air may be used.

Also, although the discharge nozzles 119 are connected to the respective independent syringes, the invention is not limited to it; for example, as far as at least the discharge nozzle 119 for the specimen reservoir 15s is connected to an independent syringe, the discharge nozzles 119 for the other reservoirs 15a, 15b, and 15w may be connected to the common syringe. This holds true also with a case where any other discharge mechanism is used in place of the syringe.

Although in the above-mentioned embodiment a syringe is provided for each of the suction nozzles 117 and for the discharge nozzle 119, the invention is not limited to it, one common syringe and a switching valve for switching it between the suction nozzle 117 and the discharge nozzle 119 in connection may be provided, to utilize the switching of the switching valve and the operations of the syringe, thus effectuating suction from the suction nozzle 117 and discharge from the discharge nozzle 119. This holds true also in a case where the syringe is replaced by any other suction/discharge mechanism.

Although in the embodiment shown in FIG. 11 the detecting mechanism employed detects a separated specimen using an ultraviolet absorbing method, the invention is not limited to it, and such a detecting mechanism may be used that utilizes any other detecting principle such as detection by use of one color or a plurality of colors of fluorescent lights or detection based on scattering of an applied detection light. Also, although the detecting mechanism employed detects a specimen at a one-point detection position, the invention is not limited to it; for